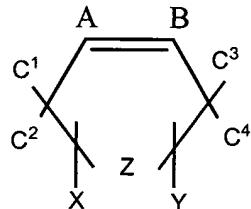


WHAT IS CLAIMED IS:

1. A film comprising at least one layer, the layer comprising an oxygen
5 scavenger composition comprising a condensation polymer and a transition
metal salt, compound or complex, wherein said polymer comprises mer
units derived from

(A) at least one or a mixture of substituted alicyclic compounds having
non-aromatic, ethylenic functionality according to the following representation:
10



wherein

15 A, B, C¹, C², C³, C⁴ each independently represents hydrogen or a
C_qH_{2q+1} hydrocarbyl group with q being an integer of from 0 to 20, provided
that either A or B and at least one of C¹, C², C³, C⁴ are hydrogen atoms and
each carbon atom of the alicyclic ring is fully substituted by hydrogen, hy-
drocarbyl, X and/or Y group(s) or mixtures thereof to fill its valence state;

20 X and Y each independently represents -(CH₂)_n-C=O)-D with n be-
ing an integer in the range from 0 to 20 and D being selected from a halide
atom or an OR group wherein R is hydrogen atom or a C₁-C₁₂ alkyl group,
or X and Y together represent -(CH₂)_n-C=O)_x-D with x being 2, n being an
integer in the range from 0 to 20 and D is oxygen atom; and

25 Z representing a -(C_tH_{2t-2})- hydrocarbylene group with t being an
integer in the range from 1-4;

(B) at least one or a mixture of difunctional hydrocarbon compounds
according to the following representation:

G-R'-G

wherein

R' represents a C₅ or greater hydrocarbon group selected from alkylene, cycloalkylene or arylene group, and
5 each G represents a hydroxyl or an amino group;

(C) at least one or a mixture of polyfunctional hydrocarbon compounds according to the following representation:

10

J-R'' (-J)_z

wherein

R'' represents a C₂-C₂₀ hydrocarbon group selected from alkylene, cycloalkylene, arylene, alkarylene or aralkylene groups or mixtures thereof;

15

J represents a functional group selected from -OH, -NH₂, -N=C=O and -(CH₂)_n-C=O)-D with n being an integer in the range from 0 to 20 and D being selected from a halide atom or an OR''' group, wherein R''' is an -H, or C₁-C₁₂ alkyl group, or two J groups together represents -(CH₂)_n-C=O_x-D with n being an integer of from 0 to 20, D being an oxygen atom and x being 2;

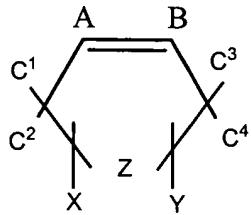
20

z is an integer of from 2 to 5; and

25

(D) at least one or a mixture of monomer compounds selected from isophthalic acid, terephthalic acid, tetrahydroisophthalic acid, tetrahydroterephthalic acid, hydrogenated isophthalic acid, hydrogenated terephthalic acid, C₁-C₁₂ alkyl esters thereof, anhydride derivatives thereof, and hydrocarbyl derivatives thereof and lower C₁-C₅ glycol ester derivatives thereof.

2. The film of claim 1 wherein monomer (A) is selected from *cis*-1,2,3,6-tetrahydronaphthalic anhydride; and dimethyl-1,2,3,6-tetrahydronaphthalate.
- 5 3. The film of claim 1 wherein monomer (B) is selected from 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol and mixtures thereof.
- 10 4. The film of claim 1 wherein the monomer (C) is selected from benzenepentacarboxylic acid, benzenehexacarboxylic acid, trimellitic anhydride, pyromellitic dianhydride, trimethylolpropane, pentaerythritol and mixtures thereof.
- 15 5. The film of claim 1 wherein monomer (D) is selected from isophthalic acid, terephthalic acid, isophthalic acid (C₁-C₃) alkyl ester, terephthalic acid (C₁-C₃) alkyl ester, bis(2-hydroxyethyl)terephthalate, bis(2-hydroxyethyl)isophthalate, hydrocarbyl substituted derivatives thereof and mixtures thereof.
- 20 6. A laminated product comprising a plurality of layers, including
i) at least one layer, the layer comprising an oxygen scavenger composition comprising a condensation polymer and a transition metal salt, compound or complex, wherein said polymer comprises mer units derived from
25 (A) at least one or a mixture of substituted alicyclic compounds having non-aromatic, ethylenic functionality according to the following representation:



wherein

5 A, B, C¹, C², C³, C⁴ each independently represents hydrogen or a C_qH_{2q+1} hydrocarbyl group with q being an integer of from 0 to 20, provided that either A or B and at least one of C¹, C², C³, C⁴ are hydrogen atoms and each carbon atom of the alicyclic ring is fully substituted by hydrogen, hydrocarbyl, X and/or Y

10 group(s) or mixtures thereof to fill its valence state;

 X and Y each independently represents -(CH₂)_n-C=O)-D with n being an integer in the range from 0 to 20 and D being selected from a halide atom or an OR group wherein R is hydrogen atom or a C₁-C₁₂ alkyl group, or X and Y together represent -(CH₂)_n-C=O)_x-D with x being 2, n being an integer in the range from 0 to 20 and D is oxygen atom; and

15 Z representing a -(C_tH_{2t-2})- hydrocarbylene group with t being an integer in the range from 1-4;

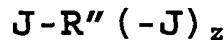
20 (B) at least one or a mixture of difunctional hydrocarbon compounds according to the following representation:



wherein

25 R' represents a C₅ or greater hydrocarbon group selected from alkylene, cycloalkylene or arylene group, and
each G represents a hydroxyl or an amino group;

(C) at least one or a mixture of polyfunctional hydrocarbon compounds according to the following representation:



5 wherein

R'' represents a C₂-C₂₀ hydrocarbon group selected from alkylene, cycloalkylene, arylene, alkarylene or aralkylene groups or mixtures thereof;

10 J represents a functional group selected from -OH, -NH₂, -N=C=O and -(CH₂)_n-C=O)-D with n being an integer in the range from 0 to 20 and D being selected from a halide atom or an OR''' group, wherein R''' is an -H, or C₁-C₁₂ alkyl group, or two J groups together represents -(CH₂)_n-C=O)_x-D with n being an integer of from 0 to 20, D being an oxygen atom and x being 2;

15 z is an integer of from 2 to 5; and

20 (D) at least one or a mixture of monomer compounds selected from isophthalic acid, terephthalic acid, tetrahydroisophthalic acid, tetrahydroterephthalic acid, hydrogenated isophthalic acid, hydrogenated terephthalic acid, C₁-C₁₂ alkyl esters thereof, anhydride derivatives thereof, and hydrocarbyl derivatives thereof and lower C₁-C₅ glycol ester derivatives thereof; and

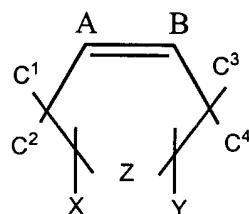
ii) at least one layer comprising a material selected from the group consisting of

- 25 a) a polymeric article,
b) a paper article, and
c) a metal article.

7. The laminated product of claim 6 wherein monomer (A) is selected from *cis*-1,2,3,6-tetrahydrophthalic anhydride; and dimethyl-1,2,3,6-tetrahydrophthalate.
- 5 8. The laminated product of claim 6 wherein monomer (B) is selected from 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol and mixtures thereof.
- 10 9. The laminated product of claim 6 wherein the monomer (C) is selected from benzenepentacarboxylic acid, benzenehexacarboxylic acid, trimellitic anhydride, pyromellitic dianhydride, trimethylopropane, pentaerythritol and mixtures thereof.
- 15 10. The laminated product of claim 6 wherein monomer (D) is selected from isophthalic acid, terephthalic acid, isophthalic acid (C₁-C₃) alkyl ester, terephthalic acid (C₁-C₃) alkyl ester, bis(2-hydroxyethyl)terephthalate, bis(2-hydroxyethyl)isophthalate, hydrocarbyl substituted derivatives thereof and mixtures thereof.
- 20 11. The laminated product of claim 6 wherein the polymeric article comprises a bottle.
12. The laminated product of claim 6 wherein the polymeric article comprises a tray.
- 25 13. The laminated product of claim 6 wherein the paper article comprises a gable top carton.
14. The laminated product of claim 6 wherein the metal article comprises a can.
- 30

15. An oxygen scavenger composition comprising a condensation polymer and a transition metal salt, compound or complex, wherein said polymer comprises mer units derived from

- 5 (A) at least one or a mixture of substituted alicyclic compounds having non-aromatic, ethylenic functionality according to the following representation:



10

wherein

A, B, C¹, C², C³, C⁴ each independently represents hydrogen or a C_qH_{2q+1} hydrocarbyl group with q being an integer of from 0 to 20, provided that either A or B and at least one of C¹, C², C³, C⁴ are hydrogen atoms and each carbon atom of the alicyclic ring is fully substituted by hydrogen, hydrocarbyl, X and/or Y group(s) or mixtures thereof to fill its valence state;

15

X and Y each independently represents -(CH₂)_n-C=O)-D with n being an integer in the range from 0 to 20 and D being selected from a halide atom or an OR group wherein R is hydrogen atom or a C₁-C₁₂ alkyl group, or X and Y together represent -(CH₂)_n-C=O)_x-D with x being 2, n being an integer in the range from 0 to 20 and D is oxygen atom; and

20

Z representing a -(C_tH_{2t-2})- hydrocarbylene group with t being an integer in the range from 1-4;

25

- (B) at least one or a mixture of difunctional hydrocarbon compounds according to the following representation:

G - R' - G

wherein

R' represents a C₅ or greater hydrocarbon group selected from alkylene, cycloalkylene or arylene group, and
5 each G represents a hydroxyl or an amino group;

(C) at least one or a mixture of polyfunctional hydrocarbon compounds according to the following representation:

10

J - R'' (-J) z

wherein

R'' represents a C₂-C₂₀ hydrocarbon group selected from alkylene, cycloalkylene, arylene, alkarylene or aralkylene groups or mixtures thereof;

15

J represents a functional group selected from -OH, -NH₂, -N=C=O and -(CH₂)_n-C=O)-D with n being an integer in the range from 0 to 20 and D being selected from a halide atom or an OR''' group, wherein R''' is an -H, or C₁-C₁₂ alkyl group, or two J groups together represents -(CH₂)_n-C=O)_x-D with n being an integer of from 0 to 20, D being an oxygen atom and x being 2;

20

z is an integer of from 2 to 5; and

25

(D) at least one or a mixture of monomer compounds selected from isophthalic acid, terephthalic acid, tetrahydroisophthalic acid, tetrahydroterephthalic acid, hydrogenated isophthalic acid, hydrogenated terephthalic acid, C₁-C₁₂ alkyl esters thereof, anhydride derivatives thereof, and hydrocarbyl derivatives thereof and lower C₁-C₅ glycol ester derivatives thereof.

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16. The composition of claim 15 wherein monomer (A) is selected from *cis*-1,2,3,6-tetrahydronaphthalic anhydride; and dimethyl-1,2,3,6-tetrahydronaphthalate.

17. The composition of claim 15 wherein monomer (B) is selected from 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol and mixtures thereof.

5

18. The composition of claim 15 wherein the monomer (C) is selected from benzenepentacarboxylic acid, benzenehexacarboxylic acid, trimellitic anhydride, pyromellitic dianhydride, trimethylolpropane, pentaerythritol and mixtures thereof.

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19. The composition of claim 15 wherein monomer (D) is selected from isophthalic acid, terephthalic acid, isophthalic acid (C_1-C_3) alkyl ester, terephthalic acid (C_1-C_3) alkyl ester, bis(2-hydroxyethyl)terephthalate, bis(2-hydroxyethyl)isophthalate, hydrocarbyl substituted derivatives thereof and mixtures thereof.

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20. The composition of claim 15 wherein the transition metal is present in from 0.001 to 1 weight percent based on the total weight of the mixture.

20

21. The composition of claim 15 wherein the transition metal is present as a salt selected from the group consisting of cobalt neodecanoate, cobalt 2-ethylhexanoate, cobalt oleate, cobalt acetylacetone, and cobalt 2-ethylbutyrate.

25

22. The composition of Claim 15 wherein the composition comprises an effective amount of a photoinitiator.

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23. The composition of claim 15 wherein the oxygen scavenger composition comprises a diluent polymer selected from the group consisting of ethylene polymer and copolymer, polyester, polyvinyl chloride, polyvi-

nylidene dichloride, polycaprolactone, polyamide, polycarbonate, polyurethane, polyether, polypropylene, polystyrene, and copolymers and mixtures thereof.

5 24. The composition of claim 15 wherein

- a) the condensation polymer is derived from monomer (C) in the amount of from 300 to 15,000 parts per million based on the total monomer content used,
- b) the condensation polymer is derived from monomer (D) in the amount of from 2 to 25 molar percent of the total of monomers (A) and (D), and
- c) the molar ratio of carboxylic acid, acid ester, acid halide and isocyanate groups to hydroxyl and amine groups of monomers (A), (B), (C) and (D) is from 0.9 to 1.1.

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